IN THE CLAIMS:

1. (ORIGINAL) A method of optically switching a signal the method comprising:

placing a dielectric microsphere capable of WGM resonance for a specific wavelength of light, with a voltage alterable steady state index of refraction "n" substantially similar to the index of refraction of a first and a second optical fiber, in close proximity with the unclad or thinly clad regions of the first and second optical fibers;

placing a pair of electrodes on either side of the dielectric microsphere;

passing voltage, adequate to alter the steady state index of refraction "n" of the dielectric microsphere, through the pair of electrodes;

providing the specific wavelength of light, the dielectric microsphere resonates for, as a signal within the first optical fiber;

terminating the voltage whereby the index of refraction "n" of the dielectric microsphere returns to its steady state;

switching the signal from the first optical fiber across the dielectric microsphere to the second optical fiber; and,

reapplying the voltage.

2. (ORIGINAL) A method of optically switching a signal the method comprising:

placing a dielectric microsphere capable of WGM resonance for a specific wavelength of light, with a voltage alterable steady state index of refraction "n" substantially dissimilar to the index of refraction of a first and a second optical fiber, in close proximity with the unclad or thinly clad regions of the first and second optical fibers;

placing a pair of electrodes on either side of the dielectric microsphere;

providing the specific wavelength of light the dielectric microsphere resonates, for, as a signal within the first optical fiber;

passing voltage adequate to alter the steady state index of refraction "n" of the dielectric microsphere, to become substantially similar to the index of refraction of the optical fibers, through the pair of electrodes;

switching the signal from the first optical fiber across the dielectric microsphere to the second optical fiber; and,

terminating the voltage whereby the index of refraction "n" of the dielectric microsphere returns to its steady state.

3. (ORIGINAL) A method of optical routing signals the method comprising:

providing a first optical fiber with an unclad or thinly clad region;

providing a second optical fiber with an unclad or thinly clad region;

placing two or more dielectric microspheres each capable of WGM resonance for a specific wavelength of light and each with a voltage alterable steady state index of refraction "n" substantially similar to the index of refraction of the optical fibers, in close proximity with the unclad or thinly clad regions of the first and second optical fibers;

placing a pair of electrodes on either side of each dielectric microsphere;

passing voltage adequate to alter the steady state index of refraction "n" of each dielectric microsphere through the pair of electrodes;

providing a plurality of signals, each of a different wavelength, within an optical band in the first optical fiber;

selecting a signal to switch;

selecting the dielectric microsphere which resonates in WGM for the selected signal and terminating the voltage applied thereto, whereby the index of refraction "n" of the selected dielectric microsphere returns to its steady state;

switching the selected signal in the first optical fiber to the second optical fiber by the WGM resonance of the selected dielectric microsphere; and,

reapplying the voltage to the selected dielectric microsphere.

4. (ORIGINAL) A method of optical routing signals the method comprising:

providing a first optical fiber with an unclad or thinly clad region;

providing a second optical fiber with an unclad or thinly clad region;

placing two or more dielectric microspheres each capable of WGM resonance for a specific wavelength of light and each with a voltage alterable steady state index of refraction "n" dissimilar to the index of refraction of the optical fibers, in close proximity with the unclad or thinly clad regions of the first and second optical fibers;

placing a pair of electrodes on either side of each dielectric microsphere;

providing a plurality of signals, each of a different wavelength, within an optical band in the first optical fiber;

selecting a signal to switch;

selecting the dielectric microsphere which resonates in WGM for the selected signal and applying voltage to it, across the pair of electrodes, whereby the steady state index of refraction "n" of the selected dielectric microsphere is altered to become substantially similar to the index of refraction of the optical fibers;

switching the selected signal in the first optical fiber to the second optical fiber by the WGM resonance of the selected dielectric microsphere; and,

terminating the voltage applied to the selected dielectric microsphere.

5-8 (CANCELED)

9. (ORIGINAL) A method of optically switching a signal the method comprising:

placing a dielectric microsphere capable of WGM resonance for a specific wavelength of light, with a light alterable steady state index of refraction "n" substantially similar to the index of refraction of a first and second optical fiber, in close proximity with the unclad or thinly clad regions of the first and second optical fibers;

directing a sufficiently intense beam of light at the microsphere, whereby its steady state index of refraction "n" is altered;

providing the specific wavelength of light the dielectric microsphere resonates for, as a signal within the first optical fiber;

terminating the sufficiently intense beam of light whereby the index of refraction "n" of the dielectric microsphere returns to its steady state;

switching the signal from the first optical fiber across the dielectric microsphere to the second optical fiber; and,

reapplying the sufficiently intense beam of light.

10. (ORIGINAL) A method of optically switching a signal the method comprising:

placing a dielectric microsphere capable of WGM resonance for a specific wavelength of light, with a light alterable steady state index of refraction "n" dissimilar to the index of refraction of a first and second optical fiber, in close proximity with the unclad or thinly clad regions of the first and second optical fibers;

providing the specific wavelength of light the dielectric microsphere resonates for, as a signal within the first optical fiber;

directing a sufficiently intense beam of light at the microsphere whereby the index of refraction "n" of the dielectric microsphere becomes substantially similar to the index of refraction of the optical fibers;

switching the signal from the first optical fiber across the dielectric microsphere, to the second optical fiber; and,

terminating the intense beam of light.

11. (ORIGINAL) A method of optical routing signal the method comprising:

providing a first optical fiber with an unclad or thinly clad region;

providing a second optical fiber with an unclad or thinly clad region;

placing two or more dielectric microsphere each capable of WGM resonance for a specific wavelength of light and each with a light alterable steady state index of refraction "n" substantially similar to the index of refraction of the optical fibers, in close proximity with the unclad or thinly clad regions of the first and second optical fibers;

directing a sufficiently intense beam of light at each dielectric microsphere, whereby the steady state index of refraction "n" is altered;

providing a plurality of signals, each of a different wavelength, within an optical band in the first optical fiber;

selecting a signal to switch;

selecting the dielectric microsphere and terminating the sufficiently intense beam of light applied thereto, whereby the index of refraction "n" of the dielectric microsphere returns to its steady state;

switching the selected signal in the first optical fiber to the second optical fiber by the WGM resonance of the selected dielectric microsphere; and,

reapplying the sufficiently intense beam of light to the selected dielectric microsphere.

12. (ORIGINAL) A method of optical routing signal the method comprising: providing a first optical fiber with an unclad or thinly clad region; providing a second optical fiber with an unclad or thinly clad region;

placing two or more dielectric microspheres each capable of WGM resonance for a specific wavelength of light and each with a light alterable steady state index of refraction "n" dissimilar to the index of refraction of the optical fibers, in close proximity with the unclad or thinly clad regions of the first and second optical fibers;

providing a plurality of signals, each of a different wavelength, within an opfical band in the first optical fiber;

selecting a signal to switch;

selecting the dielectric microsphere and directing a sufficiently intense beam of light applied thereto, whereby the index of refraction "n" of the dielectric microsphere becomes substantially similar to the index of refraction of the optical fibers;

switching the selected signal in the first optical fiber to the second optical fiber by the WGM resonance of the selected dielectric microsphere; and,

terminating the sufficiently intense beam of light directed at the selected dielectric microsphere.

13-18 (CANCELED)

19. (ORIGINAL) An optical switch comprising:

a first optical fiber with an unclad or thinly clad region;

a second optical fiber with an unclad or thinly clad region; an optical trap; and

a dielectric microsphere capable of WGM resonance for a specific wavelength of light contained within the optical trap which has a steady state index of refraction "n" substantially similar to the index of refraction of the optical fibers.

20. (ORIGINAL) An optical router comprising:

a first optical fiber with an unclad or thinly clad region;

a second optical fiber with an unclad or thinly clad region;

a plurality of optical traps; and

a plurality of dielectric microspheres each capable of WGM resonance for a specific wavelength of light and each contained within an optical trap which has a steady state index of refraction "n" substantially similar to the index of refraction of the optical fibers.

21-275 (CANCELED)

276. (ORIGINAL) An optical filter comprising:

an input waveguide;

a first subfilter, which can switch a first group of resonate signals, fixed proximate to the input waveguide;

a second subfilter, which can switch a second group of resonate signals, one is also a resonate signal of the first subfilter, fixed proximate to the first subfilter; and

an output waveguide fixed proximate to the second subfilter.

277-278 (CANCELED)

279. (ORIGINAL) An optical filter comprising:

an input waveguide;

a first subfilter, which can switch a first group of resonate signals, fixed proximate to the input waveguide, whereby the first subfilter can receive optical signals travelling within the input waveguide;

a second subfilter which can switch a second group of resonate signals one of which is also a resonate signal of the first subfilter, fixed proximate to the first subfilter, whereby the second subfilter can receive optical signals from the first subfilter;

an output waveguide fixed proximate to the second subfilter; and

an "on/off" means for controlling at least one of the first and second subfilter.

280. (ORIGINAL) An optical filter comprising:

an input waveguide;

an output waveguide;

a first WGM resonate structure which resonates in WGM for a first group of resonate signals fixed proximate to the input waveguide forming a first resonate structure-waveguide interface, whereby optical signal propagation of an evanescent wave from the input waveguide to the first resonate structure can occur;

a second WGM resonate structure which resonates in WGM for a second group of resonate signals, one of which is also a resonate signal of the first resonate structure, fixed proximate to the first resonate structure forming a direct optical-switch interface, whereby optical signal propagation from the first WGM resonate structure to the second WGM resonate structure can occur; and

a second resonate structure-waveguide interface formed between the second WGM resonate structure and the output waveguide, whereby optical signal propagation from the second WGM resonate structure to the output waveguide can occur.

281-295 (CANCELED)

296. (ORIGINAL) An optical filter comprising:

an intermediary waveguide;

a first subfilter for a first group of resonate signals fixed proximate to an input waveguide and the intermediary waveguide; and

a second subfilter for a second specific group of resonate signals, one of which is also a resonate signal of the first optical switch, fixed proximate to the intermediary waveguide and an output waveguide.

297-422 (CANCELED)

423. (ORIGINAL) A method of switching "on/off" an optical filter, comprising:

coupling an optical signal to a WGM resonate structure having a binding agent thereon; coupling the optical signal from said WGM resonate structure to a secondary structure which supports signal propagation; and

detecting a presence of an analyte by one of a change in frequency, attenuation, and destruction of said optical signal to trigger switching of said "on/off 'optical filter.

424-428 (CANCELED)